RAF ALCONBURY 2011 WATER QUALITY REPORT

Introduction

Air Force Instruction 48-144, *Safe Drinking Water Surveillance Program*, and the United States Environmental Protection Agency (USEPA) require that all community water systems provide to consumers an annual water quality report. This report will help consumers understand where their drinking water comes from and what is in it. It will help them to make informed choices that affect their families' health and help everyone understand the importance of protecting our drinking water sources.

Source Water

The 423rd Civil Engineer Squadron operates RAF Alconbury's potable water distribution system. Water is supplied by one source. The base purchases water from Anglian Water, the region's supplier. The Anglian Water feed is from their Huntingdon North Supply Zone, which originates from the Grafham Water Reservoir.

Treatment Process

RAF Alconbury's water supply is sand filtered, ozonated and then carbon filtered by Anglian Water to remove particulates, volatile organic compounds and pesticides before being chlorinated using chloramine. Before distribution at the installation, the water is chlorinated again using sodium hypochlorite. Chlorination of the water supply is completed for disinfection purposes and prevents bacteriological growth in the distribution system.

Testing

A Bioenvironmental Engineering (BE) team collects weekly bacteriological samples from various locations in the water distribution system. These samples are analyzed in the BE water lab to ensure no bacteriological growth is present in the distribution system. BE also collects monthly water samples from representative locations in the water system and sends them to Northumbrian Water Scientific Services laboratory for chemical analysis and additional bacteriological testing. Northumbrian Water Scientific Services is headquartered in Newcastle upon Tyne, England, with laboratories throughout England, but primarily analyzing drinking water at their Horsley, Newcastle upon Tyne lab. Several water samples are sent to the US Army Public Health Command Laboratory (PHCR - Europe). The results are reviewed and maintained by the Bioenvironmental Engineering office at RAF Upwood to ensure compliance with both U.K. Drinking Water Inspectorate (DWI) and U.S. safe drinking water standards.

Water Analysis Results

RAF Alconbury's water supply is tested for 131 substances. The table below lists the contaminants detected that require reporting by the USEPA and the September 2010 US Department of Defense Environmental Final Governing Standards - United Kingdom (FGS-UK). Drinking water, including bottled water, may reasonably be expected to contain at least a small amount of some contaminants. **The presence of contaminants does not necessarily indicate that the water poses a health risk.** More information about contaminants and potential health effects can be obtained by calling the USEPA Safe Drinking Water Hotline at (202) 564-3750 or by going to their ground and drinking water website at http://www.epa.gov/safewater.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or

result from urban storm runoff and industrial or domestic wastewater discharges.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential use.
- Organic chemical contaminants, including synthetic or volatile organic chemicals, which are byproducts of industrial processes and can come from gas stations, urban storm water runoff and septic systems.
- Radioactive contaminants, which can naturally occur or be the result of industrial activities.

In order to ensure that tap water is safe to drink, limits/levels are established on the amount of certain contaminants that can be present in drinking water provided by public water systems. The limits below are from the FGS-UK. This document integrates U.S. and U.K. requirements by implementing the more stringent limit of any chemical regulated by either country.

Results Discussion

The results in the table below include all chemicals covered by both U.K. DWI and U.S. safe drinking water standards for which analysis was performed and concentrations of the chemicals that were detected from 1 January 2011 to 31 December 2011.

During CY 2011 sampling time frame, RAF Alconbury received zero exceedances of the Maximum Contaminant Limit (MCL) for any of the chemicals of health concern.

Additional Health Information

Some individuals may be more susceptible to contaminants in drinking water than the general population. Immuno-compromised persons such as those with cancer undergoing chemotherapy, those that have undergone organ transplants, individuals with HIV/AIDS or those with immune system disorders and some elderly and infants, can be particularly at risk from infections.
These people should seek advice about their drinking water from their health care providers. The USEPA and the US Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the USEPA Safe Drinking Water Hotline (202) 564-3750.

Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We strive to provide high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Input and Information

If you have any questions, please contact TSgt Thomas Echelmeyer or SSgt Muneerah Williams in Bioenvironmental Engineering Services, Upwood Clinic at DSN 268-4517/4746 or 07801880122.

TEST RESULTS

SUBSTANCE (* See note 1)	**RANGE** ND = None detected (See note 2)	**MAXIMUM CONTAMINANT LIMIT** (MCL)	**POSSIBLE SOURCE** (Applies to all water in general) **& COMMENTS**
22°C Plate Count	9-24 /mL @ 22°C	No significant increase over that normally observed as CFU/mL at 22°C	Significant Increase Plate Count is defined as having >50 CFU/mL
Antimony	0.00047 mg/L	0.005 mg/L	
Arsenic	0.00095 mg/L	0.01 mg/L	
Barium	0.018 - 0.025 mg/L	2 mg/L	Erosion of natural deposits
Boron	0.11- 0.13 mg/L	1 mg/L	
Bromate	0.0035 mg/L	0.01 mg/L	
Cadmium	0.0000081	0.005 mg/L	
Carbetamide	0.0000071 mg/L	0.001	
Chloride *	81 - 98 mg/L	250 mg/L	
Clopyralid	0.00003 mg/L	0.0001 mg/L	
Color *	11 mg/L Pt/Co	20 mg/L Pt/Co	
Conductivity	780-790 uS/cm 20°C	2500 uS/cm 20°C	
Copper *	0.0053-0.51 mg/L	2 mg/L	
Cyanide	0.0056 mg/L	0.05 mg/L	
Dalapon	0.00019-0.00022 mg/L	0.2 mg/L	
Fluroide	0.22 mg/L	1.5 mg/L	
Gross Alpha	0.028-0.029 Bq/L	0.555 Bq/L	A natural element of the Earth's crust
Gross Beta	0.044-0.387 Bq/L	1.85 Bq/L	A natural element of the Earth's crust
Iron	0.0094 - 0.019 mg/L	0.2 mg/L	
Lead	0.00032-0.0092 mg/L	0.015 mg/L	
Magnesium	7.8 – 8.1 mg/L	50 mg/L	
Nickel	0.0037 mg/L	0.02 mg/L	
Nitrate as N	0.81-3.61 mg/L	10	
PAH	0.00000051 mg/L	0.0001 mg/L	
Pentachlorophenol	ND – 0.0000055 mg/L	0.001 mg/L	
pH (Hydrogen Ion) *	7.8– 7.9	6.5 - 9.5	Drinking water is expected to have a fairly neutral pH amount (5.5-9.5)
Selenium	0.00033 mg/L	0.01 mg/L	
Sodium	65 mg/L	200 mg/L	
Sulphate *	110 mg/L	250 mg/L	
Total Organic Carbon	3.6-4.1 mg/L C	No abnormal changes	
Total Pesticides	0.0000925– 0.00033 mg/L	0.0005 mg/L	All individual pesticides are calculated together for each sample.

TTHM	0.0426 – 0.0698 mg/L	0.08 mg/L	By-product of drinking water chlorination
Turbidity	0.09-0.17 NTU	1 NTU	Measure of water clarity, not health related
Zinc *	0.0036 – 0.0092 mg/L	5 mg/L	

Definitions:

Ca – chemical symbol for calcium. Minerals found in hard water cause by limestone, chalk and in other mineral deposits.

CFU - plate count used to provide a direct number of organisms in water.

FGS-UK - Final Governing Standards for the United Kingdom - The governing environmental regulation for US military bases in the UK.

HCO_3 – Alkalinity is expressed in HCO_3, a biocarbonate. HCO_3, is a vital component in a pH buffering system. It is a salt that helps maintain a neutral pH in the water.

MCL - Maximum Contaminant Level - The highest level of contaminant that is allowed in drinking water. MCLs are enforceable standards.

mg/L - milligrams per liters - A unit of measure used to describe the levels of detected contaminants. 1 milligram per liter is equivalent to 1 part per million.

ND - Not Detected - No chemical detected; however, laboratories can only detect a specified quantity or concentration of the chemical in drinking water. This is known as the Limit of Detection.

NTU - Nephelolometric Turbidity Units. A unit used to describe the clarity of water. Higher numbers relates to more cloudy water.

PAH - Polycyclic Aromatic Hydrocarbons. The sum of the detected concentrations of benzo-3,4(b)-fluoranthene, benzo-11,12(k)-fluoranthene, benzo-1,12(ghi)-perylene, and indeno-(1,2,3-cd)-pyrene.

PCV - Prescribed Concentration or Value - The maximum concentration of a contaminant or the maximum value of any parameter, which might affect the wholesomeness, or aesthetics of a water supply.

pCi/L - picocuries per liter. Measure of radioactivity in water.

TTHM - Total Trihalomethanes. The sum of the detected concentrations of chloroform, bromoform, dibromochloromethane, and bromodichloromethane in mg/L.

µS/cm - microsiemens per centimeter. Is a unit expressing the amount of electrical conductivity of a solution.

NOTES:

(1) Items marked with an asterisk (*) are 'secondary standards' with a PCV rather than an MCL. See PCV and MCL definitions above. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water.

(2) Limitations in laboratory performance results in analysis for some contaminants being reported as "not detected (ND)." The lowest level of contaminant that the laboratory can detect is called the Limit of Detection (LOD). In 2010, levels of contaminants were verified to be below the FGS-UK MCL; therefore, compliance was met.